

REMARKS

The present application is directed to methods and compositions comprising mycobacterial DNA for treating cancer. More specifically, the present invention is directed to methods and compositions which contain mycobacterial DNA for the treatment of prostate cancer.

In an effort to facilitate prosecution, Claims 40, 48, and 66-68 have been amended, Claims 69-78 have been added and therefore, following entry of this amendment Claims 26-50, and 66-78 will be pending in this application. No new matter has been added and support for the amendments is found throughout the specification.

Double Patenting

In the June 4, 2003 Office Action, the Examiner rejected Claims 26-56 and 66-68 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 3-30 of United States Patent No. 6,326,357 (hereafter '357) in view of Morales et al., J. Urology, 153:1706-10 (1995) (hereinafter referred to as "Morales").

The Examiner asserted that '357 claims a method for treating cancer by administering to a patient having cancer a composition comprising *M. phlei* DNA preserved and complexed on the *M. phlei* cell wall wherein the *M. phlei* are disrupted and the solid components are deproteinized, delipidated, and washed, and that DNase-free reagents are used to minimize M-DNA degradation during preparation. The Examiner stated that although the '357 patent does not disclose that such a composition can be used to treat prostate cancer, Morales teaches that fractionated and deproteinized emulsions of *M. phlei* cell walls (which would necessarily comprise *M. phlei* DNA (according to the Examiner)) have antineoplastic effects on prostate cancer cells. The Examiner concluded therefore, that one of ordinary skill in the art would have been motivated to use the composition of '357 to treat prostate cancer because Morales teaches that "*M. phlei* cell wall complex (which comprises *M. phlei* DNA) can be used to treat prostate cancer", and that therefore, the instant claims are obvious variants over the invention claimed in '357. Applicants respectfully traverse.

Applicants respectfully submit that Morales cannot be properly combined with '357 to obviate the present invention. Specifically, Morales fails to satisfy the deficiency of the '357 patent with regard to the present invention because whereas it does teach the use of *M. phlei* cell wall complex, it does not specifically teach or suggest the use of mycobacterial DNA for use in anti-cancer compositions as currently claimed. Basically, '357 teaches Composition A for the treatment of cancer (specifically leukemia, lymphoma, melanoma, bladder cancer, colon cancer, esophageal cancer and cecal cancer), and Morales teaches the use of Composition B for the treatment of prostate cancer. Although the compositions both happen to be related *M. phlei*, one skilled in the art would not necessarily conclude that both compositions are identical or even equivalent. Furthermore, one skilled in the art would not conclude that since a particular composition is effective for the treatment of one type of cancer, that it would be useful or successful for the treatment of another type of cancer.

Indeed, on page 11 of the Office Action in the second paragraph following *Response to Arguments*, the Examiner stated, "It is acknowledged that Morales does not teach that the B-DNA used in the experiments is obtained from a disrupted mycobacterium using DNase-free reagents. Considering that the claims require that the B-DNA is obtained from a disrupted mycobacterium using DNase-free reagents to at least partially preserve the DNA, the rejection [35 USC 102(b)] is withdrawn." The rejection under 35 USC 103(a) was also removed following a similar acknowledgement. Based on the foregoing, Applicants respectfully submit that the rejection of Claims 26-56 and 66-68, under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 3-30 of '357 in view of Morales, is improper and request that it be withdrawn.

Claims 26-56 and 66-68 were also rejected in the June 4, 2003 Office Action under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-24 of United States Patent No. 6,329,347 (hereafter '347) in view of Morales et al., J. Urology, 153:1706-10 (1995) (hereinafter referred to as "Morales.").

The Examiner asserted that the '347 patent claims a method for the treatment of bladder cancer by administering to a patient having cancer, a composition comprising *M.*

phlei DNA preserved and complexed on the *M. phlei* cell wall. The Examiner asserted that the patent further discloses that the *M. phlei* are disrupted and the solid components are deproteinized, delipidated, and washed and that DNase-free reagents are used to minimize M-DNA degradation during preparation. The Examiner stated that although the '347 patent does not disclose that such a composition can be used to treat prostate cancer, Morales teaches that fractionated and deproteinized emulsions of *M. phlei* cell walls (which would necessarily comprise *M. phlei* DNA (according to the Examiner)) have antineoplastic effects on prostate cancer cells. The Examiner concluded, that one of ordinary skill in the art would have been motivated to use the composition of '347 to treat prostate cancer because Morales teaches that "*M. phlei* cell wall complex (which comprises *M. phlei* DNA) can be used to treat prostate cancer", and that therefore, the instant claims are obvious variants over the invention claimed in '347. Applicants respectfully traverse.

Applicants respectfully submit that Morales cannot be properly combined with '347 to obviate the present invention. Specifically, Morales fails to satisfy the deficiency of the '347 patent with regard to the present invention because whereas it does teach the use of *M. phlei* cell wall complex, it does not specifically teach or suggest the use of mycobacterial DNA for use in anti-cancer compositions as currently claimed. Basically, '347 teaches Composition C for the treatment of bladder cancer, and Morales teaches the use of Composition B for the treatment of prostate cancer. Although the compositions both happen to be related to *M. phlei*, one skilled in the art would not necessarily conclude that both compositions are identical or even equivalent. Contrary to what is stated in the Office Action, it is not certain whether mycobacterial DNA is actually present in the Morales composition because unlike the present invention, no steps are taken to preserve the mycobacterial DNA from degradation.

As the Examiner acknowledged later in the office action, Morales fails to disclose a composition that anticipates the composition as currently claimed, and as previously argued, given the lack of predictability with regard to the treatment of cancer, one skilled in the art would not expect that the treatment for one type of cancer would necessarily be useful or successful for the treatment of another type of cancer. Accordingly, Applicants respectfully submit that the '347 patent and Morales cannot be combined to render

obvious the present invention. Reconsideration and withdrawal of this rejection is therefore respectfully requested.

In summary, Applicants respectfully submit that the present invention is not properly rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the claims of United States Patent No. 6,326,357 or United States Patent No. 6,329,347 in view of Morales for the following main reasons:

1. The present invention claims compositions and methods of treating prostate cancer comprising administration of a composition comprising: (a) mycobacterial DNA (B-DNA) obtained from a disrupted mycobacterium using DNase-free reagents the mycobacterial DNA preserved and complexed on mycobacterial cell wall (BCC); and (b) a pharmaceutically acceptable carrier.
2. United States Patent No. 6,326,357 teaches methods for treating cancer by administering to a patient having cancer a composition comprising *M. phlei* DNA preserved and complexed on the *M. phlei* cell wall, wherein *M. phlei* are disrupted and the solid components are deproteinized, delipidated, and washed and that DNase-free reagents are used to minimize M-DNA degradation during preparation. The patent does not teach treatment of prostate cancer.
3. United States Patent No. 6,329,347 teaches methods for treating bladder cancer by administering to a patient having cancer, a composition comprising *M. phlei* DNA preserved and complexed on the *M. phlei* cell wall, wherein *M. phlei* are disrupted and the solid components are deproteinized, delipidated, and washed and that DNase-free reagents are used to minimize M-DNA degradation during preparation. The patent does not teach treatment of prostate cancer.
4. Morales teaches that fractionated and deproteinized emulsions of *M. phlei* cell walls have antineoplastic effects on prostate cancer cells. Morales not teach anti-cancer compositions comprising *M. phlei* DNA.
5. Morales cannot be properly combined with either United States Patent No. 6,326,357 or 6,329,347 because the Morales composition is distinct from compositions disclosed in either of the referenced patents. One skilled in the art would not conclude therefore, that the compositions revealed in the referenced patents would be useful or successful for the treatment of prostate cancer based on the teaching of Morales.

Claim Rejections 35 U.S.C. 112

Rejection of Claims 66-68 under 35 U.S.C. 112, second paragraph

Claims 66-68 were rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner stated that there was insufficient antecedent basis for the recitation of “the amount of M-DNA” in line 9 of Claim 66, and for the recitation of “the amount of M-DNA” in Claims 67 and 68. Applicants have herein amended the claims to obviate rejection. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

Rejection of Claims 26-56 and 66-68 under 35 U.S.C. 112, first paragraph

The Examier rejected Claims 26-56 and 66-68 under 35 U.S.C. 112, first paragraph because according to the Examiner, they do not reasonably provide enablement for the full scope encompassed by the claims.

Specifically, the Examiner stated that the claims are not enabled for general (e.g. *systemic*) delivery of a composition comprising *any mycobacterial* DNA. Applicants respectfully traverse. Support is found throughout the specification for various routes of administration for the mycobacterial compositions of the present invention. Applicants respectfully direct the Examiner to page 13, lines 12-17 wherein a list of possible administrative routes is provided. Furthermore, Applicants direct the Examiner to the Examples section, for instance Examples 5 “Inhibition of Prostate Cancer Cell Proliferation by MCC”, Example 6 “Inhibition of Prostate Cancer Cell Proliferation by M-DNA” and Example 7 “Inhibition of Prostate Cancer Cell Proliferation by MCC and by Dnase I treated MCC”. Given the substantial experimental data supporting the role of the present invention in inhibiting prostate cancer cell proliferation, one skilled in the art would be able to readily extrapolate the analogous applicability of these findings to administering the compositions via the blood stream to the prostate cancer site. Accordingly, reconsideration and withdrawal of the present invention is respectfully requested.

Concerning rejection of the claims on the basis that they are not enabled for any mycobacterial DNA, Applicants respectfully disagree. The specification provides

support and teaching that the other mycobacterial species may be included within the scope of the invention, see for example page 8, lines 6-12. As has been established, it is not necessary for an applicant to provide a working example for every species of a genus claimed. Accordingly, reconsideration and withdrawal of the present invention is respectfully requested.

Conclusion

For at least the above reasons, Applicants respectfully request allowance of claims Claims 26, 29-40, 43-50, and 66-68 and issuance of a patent containing these claims in due course. If there remain any additional issues to be addressed, the Examiner is urged to contact the undersigned attorney.

The foregoing is submitted as a full and complete response to the Office Action mailed June 4, 2003. Applicants respectfully submit that the claims are fully enabled, novel and non-obvious over the cited art. Applicants assert that the claims are now in condition for allowance and respectfully request that the application be passed to issuance. If the Examiner believes that any informalities remain in the case, which may be corrected by Examiner's amendment, or that there are any other issues which can be resolved by a telephone interview, a telephone call to the undersigned attorney at (404) 815-6500 is respectfully solicited.

Respectfully submitted,
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